

CLAIMS

1. A packet transfer control method for controlling output order when a plurality of packets to be provided are selectively output to an output line comprising the steps of:
- identifying a flow, to which a provided packet belongs;
 - reading out flow setting information for the identified flow from previously set information;
 - measuring an arrival rate of the packet;
 - calculating an arrival rate for the flow, to which the packet belongs based on the arrival rate of the packet;
 - performing class setting of the flow, to which the packet belongs in units of packet by comparing the arrival rate for the flow to the read flow setting information; and
 - controlling the output order of the plurality of packets based on the class of the class-set flow, to which the packet belongs.
2. The packet transfer control method according to claim 1, wherein in the step of performing class setting, when the arrival rate for the flow, to which the packet belongs is less than or equal to a value of the minimum guaranteed band information in the flow setting information, the class of the flow, to which the packet belongs is set to the reference

priority class in the flow setting information; and when the arrival rate for the flow, to which the packet belongs is larger than the value of the minimum guaranteed band information and is less than or equal to a value of the upper
5 limit band information in the flow setting information, the class of the flow, to which the packet belongs is set to the class lower than the reference priority class in the flow setting information.

10 3. The packet transfer control method according to claim 2, wherein in the step of performing class setting, when the arrival rate for the flow, to which the packet belongs is larger than the value of the upper limit band information in the flow setting information, the class of the flow, to
15 which the packet belongs is set to the class still lower than the class set when the arrival rate for the flow, to which the packet belongs is larger than the value of the minimum guaranteed band information and is less than or equal to the value of the upper limit band information in the flow setting
20 information.

4. The packet transfer control method according to claim 1 or 2 comprising the step of:
performing disposition process of the packet, when the
25 arrival rate for the flow, to which the packet belongs is

compared to the value of the upper limit band information
in the flow setting information, and then the arrival rate
for the flow, to which the packet belongs is larger than the
value of the upper limit band information in the flow setting
5 information.

5. The packet transfer control method according to claim
1 or 2 comprising the step of:

performing order management so that the firstly
10 arrived packet is output first in terms of a plurality of
packets belonging to the same flow.

6. The packet transfer control method according to claim
1 or 2, wherein in the step for controlling output order,
15 flow identification information for identifying the flow is
stored in a FIFO queue set correspondingly to each class based
on the class of the class-set flow, to which the packet
belongs, and the flow to be output next is specified by
reading out the flow identification information from the
20 FIFO queue of the high priority class.

7. The packet transfer control method according to claim
1 or 2 comprising the steps of:

reading out group setting information for a group, to
25 which the identified flow belongs from previously set

information;

calculating an arrival rate for the group, to which
the flow belongs based on the arrival rate of the packet;

performing disposition process of the packet when the
5 arrival rate for the group is compared to a value of the upper
limit band information in the group setting information, and
the arrival rate for the group of the flow is larger than
the value of the upper limit band information in the group
setting information.

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8. A packet transfer control circuit for controlling
output order when a plurality of packets to be provided are
selectively output to an output line comprising:

a flow identification means for identifying a flow,
15 to which a provided packet belongs;

a flow setting information storage means for storing
information previously set for each of a plurality of flows;

a rate measurement means for measuring an arrival rate
of the packet;

20 a rate calculation means for calculating an arrival
rate for the flow, to which the packet belongs based on the
arrival rate of the packet;

a class setting means for performing class setting of
the flow, to which the packet belongs in units of packet by
25 comparing the arrival rate for the flow to flow setting

information for the flow read out from the flow setting information storage means after identification of the flow by the flow identification means; and

an output control means for controlling the output
5 order of the plurality of packets based on the class of the flow, to which the packet belongs set by the class setting means.

9. The packet transfer control circuit according to claim
10 8, wherein when the arrival rate for the flow, to which the packet belongs is less than or equal to a value of the minimum guaranteed band information in the flow setting information, the class setting means sets the class of the flow, to which the packet belongs to the reference priority class in the
15 flow setting information; and when the arrival rate for the flow, to which the packet belongs is larger than the value of the minimum guaranteed band information in the flow setting information and is less than or equal to a value of the upper limit band information, the class setting means
20 sets the class of the flow, to which the packet belongs to the class lower than the reference priority class in the flow setting information.

10. The packet transfer control circuit according to claim
25 9, wherein when the arrival rate for the flow, to which the

packet belongs is larger than the value of the upper limit band information in the flow setting information, the class setting means sets the class of the flow, to which the packet belongs to a class still lower than the class set when the arrival rate for the flow, to which the packet belongs is larger than the value of the minimum guaranteed band information and is less than or equal to the value of the upper limit band information in the flow setting information.

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11. The packet transfer control circuit according to claim 8 or 9 comprising:

a packet disposition means for performing disposition process of the packet, when the arrival rate for the flow, to which the packet belongs is compared to the value of the upper limit band information in the flow setting information, and then the arrival rate for the flow, to which the packet belongs is larger than the value of the upper limit band information in the flow setting information.

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12. The packet transfer control circuit according to claim 8 or 9 comprising:

a packet order management means for performing order management so that the firstly arrived packet is output first in terms of a plurality of packets belonging to the same flow.

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13. The packet transfer control circuit according to claim 8 or 9, wherein the output control means comprises a plurality of FIFO queues set correspondingly to each class and a flow
5 selection means for reading out the flow identification information from the FIFO queue of the high priority class in order to specify the flow to be output next, and wherein
the flow identification information for identifying the flow is stored in one of the plurality of FIFO queues
10 set correspondingly to each class based on the class of the class-set flow, to which the packet belongs, and the flow to be output next is specified by reading out the flow identification information stored in the FIFO queue of the high priority class by the flow selection means.

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14. The packet transfer control circuit according to claim 8 or 9 comprising:

a group setting information storage means for storing information previously set for each of a plurality of groups,
20 in which a plurality of flows are grouped;

a group rate calculation means for calculating an arrival rate for the group, to which the flow belongs based on the arrival rate of the packet and;

a packet disposition means for performing disposition
25 process of the packet when the arrival rate for the group

is compared to a value of the upper limit band information in the group setting information read out from the group setting information storage means after identification of the flow by the flow identification means, and the arrival
5 rate for the group, to which the flow belongs is larger than the value of the upper limit band information in the group setting information.